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THE PERMANENCY OF PHOTOGRAPHS—SILVER, CARBON, AND PLATINUM.

BY FR. WILDE.

TRANSLATED FROM THE GERMAN BY J. F. SACHSE.

THE following communication to the *Photographisches Woch-enblatt* (Berlin, Nov. 27, 1890), by Fr. Wilde, of Görlitz, a photographer of over forty years' experience, should be carefully read and studied by all photographers, professionals as well as advanced amateurs. We have endeavored to reproduce the paper with all the idiom of the original, and trust that it has not lost any of its excellence in the translation from the language of the Fatherland :

With great injustice has the reproach of instability been so often cast upon our silver prints. Usually this has been done for advertising purposes. In the commencement of the seventies it was done in the interest of the carbon or pigment process; in later years, to boom up the platinum process.

I, however, claim, according to my own experience and observations, that when a silver print changes or fades it is entirely due to carelessness in the process of its production, such as insufficient fixing or non-elimination of the hyposulphite of soda, or the use of unsuitable paper or faulty preparation of the same.

Out of my long practice as a photographer (since 1848) I possess specimen silver prints from each year, and all are fault-

lessly preserved. The oldest photograph in my possession was made in the fall of 1850. Prior to that time I made daguerreotypes exclusively; the demand for these ceased only with the introduction of the collodion process.

At that period photography was not so easy or convenient as it is to-day. There was no extensive technical literature, in which thorough professionals so disinterestedly published their experiences for the good of the profession in general.

No paper especially manufactured or prepared for photographic purposes was to be obtained in the trade, nor were the necessary chemicals to be obtained in their requisite purity without the greatest difficulty.

Prior to the introduction of the collodion process the negatives were made on paper, which the photographer had to prepare, as well as that for the prints. The latter remained the case for a long time, even after glass was substituted for paper.

All causes of failure had then to be sought for at home, and could not, as now so often the case, be shifted upon the shoulders of the manufacturer, without cause or justice. Those who went through this epoch of photography—and there are but few of such veterans—must admit that the progress which the art has made with such giant strides is not altogether due to the professional photographer, but that to the amateur, with his equipment of greater scientific knowledge, much of the credit is due.

On paper prepared merely with the salts the image invariably sunk more or less into the paper; to remedy this defect additions of various substances were made to the salting solution, such as different kinds of starch (arrowroot paper), or decoctions of various mosses (algein paper), of gelatine, whey, or casein, in connection with such acids as tartaric, citric, or succinic acid.

The best results which I ever obtained were on a strong, somewhat rough Steinbach paper, which was prepared with casein, sodium chloride, neutral citrate of potassium, and floated upon an eight per cent. silver solution. They were more vigorous than prints on albumenized paper, and reproduced the finest detail and beauties of the negative better than the latter.

The gold baths for toning prints were not known. With sul-

phurous fixing baths the prints were simultaneously fixed and toned,—a method valueless for albumen; therefore it was only used occasionally for landscapes and architectural subjects. It was not until the discovery of the gold toning bath that we were enabled to give the desired tones.

To return to our subject, even such prints as were produced by the silver-sulphide toning bath, which have been in my possession since the commencement of the early fifties, have kept perfectly, without exception. This is the result of the great care, which I always insisted upon, to thoroughly eliminate all traces of hypo from the prints.

The method I follow was communicated to me by Lutze. Although it is but rarely practiced, I would recommend it to all the craft, on account of the excellent results.

The method is as follows: The well-fixed prints are placed direct from the hypo into a solution of common salt for sixty or ninety minutes, during which time the solution is frequently renewed until, when a piece of the paper is chewed, the taste is clear salt, without any disagreeable after-taste. Then the prints are to be washed in clear water until the same test shows that the saltiness has also disappeared. This method may seem to many home-baked and mechanical; still it is valuable in the practice.

I have already mentioned that faulty or unsuitable preparation of the paper may cause an instability of the silver print. This is especially true of prints on albumenized paper if the albumen is more or less colored with pink or violet. Prints on such paper in the course of time all assume a dirty color, while on paper coated with a film of uncolored albumen the prints remain unaltered.

When albumenized paper was first introduced, it was prepared by the individual photographer from pure egg-albumen, without the addition of any coloring matter. It is only since the wholesale production of photographic papers that the various shades of color have been introduced. In later years, however, a little more caution is exercised in the use of such papers; the use of a decided pink shade is especially on the decline.

The thickness of the albumen coating on the paper is also a factor in the stability or permanency of the photograph. Photographs made by myself thirty years ago, on paper with a thin colorless coating of albumen, have kept much better than many made in later years on paper which was heavily albumenized.

The object in introducing albumenized paper was not to obtain a high gloss, but mainly to keep the image upon the surface of the paper by the aid of its thin, hard surface. The small form "visite" whole figure, which dominated for several years, gave the incentive for a paper with a heavier, glossier coating. At present, in carte and cabinet sizes portraits only are required, and in these we can well dispense with the exaggerated gloss so often seen. It is a matter of taste whether the addition of a high gloss is desirable for portraits, about which we will not argue. Taste and demand are regulated by fashion. Many of our fashions are extremely ugly; nevertheless, the public demand them because they are the fashion.

Many of our best artists abhor the highly glossed photographic portraits, and find in the platinum print all requisite requirements.

Albumen films after a time all incline to become yellow, even if ever so little. As I became aware of this fact, years ago, I tried the means taken by our domestics to keep their washed linen white, viz., before hanging up to dry they draw them through a blue water, to prevent yellowness and keep the linen perfectly white.

The photographic prints on uncolored albumen paper, after being fixed and well washed, were placed for a short time in a bath of water colored with the finest cobalt blue. Even if the water appears dark, it leaves but a slight tinge, which suffices to remove the yellow tinge so apt to show in the white surfaces on the print.

I will now call attention to another troublesome matter, which has not been obviated notwithstanding the repeated warnings given, viz., the use of cards for mounting prints which have been printed with bronze powder. The fine bronze powder never adheres so fast to the mount but that some particles, in packing or handling, become spread over the mount. If these particles

are not carefully removed, they will cause spots and blemishes, for whose appearance you will not have long to wait.

We ask, Must bronze powder be used? No. Why so thoughtlessly use a medium which destroys the photograph? Fine colored inks can be used to produce just as fine and tasteful effects, and give no cause for destroying the photograph in the course of time. I cannot, while upon this subject, refrain from calling attention to the tendency, lately evolved, which has resulted in the mounts being overloaded with gaudy decorations. Simple embellishment with good taste are certainly easily combined, and are far preferable.

While we complain about the shrinkage of the prices for photographs, yet at the same time we reduce the margin of profit still more by extravagance in the gaudy and useless embellishments on our mounts.

In several of our leading and most-frequented galleries the experiment was tried to again return to the use of plain mounts, without any noticeable diminution of patronage.

It is well to be cautious in the use of dark-colored mounts, and especially in all where the color is coated, it is best to confine ourselves to neutral mounts,—either white or faint tints of grey or buff.

Silver prints are also made on argentic chloride collodion paper,—argentic, chloride, gelatine, and bromo-silver-gelatine papers. Regarding the first of these three specialities I have had an experience since 1876, and can testify that they are permanent. I must, however, mention that in isolated cases the film or coating is apt to strip or peel off; possibly the emulsion used in such cases was too stiff.

Many photographers are in the habit of using argentic collodion prints in their show-cases, as they are supposed to be more permanent than prints on albumenized paper. This is true only in the case of pink-tinted albumen paper, which, if continuously exposed to bright daylight, soon loses its delicate shade, and becomes tawny like a piece of chamois leather. In tinted argentic collodion papers the pigment is not incorporated with the emulsion, but is added to the coating of Barytes on the

paper, and which serves as the support to the sensitive film. In coloring Barytes more stable pigments can be used than with albumen.

Regarding prints on chloro-silver-gelatine and bromo-silver-gelatine papers, my experience regarding the first extends over a period of eight years; regarding the latter, six years; and are of such a character that I do not doubt their stability. Notwithstanding the advantages offered by these three latter processes, they have for some reason interfered but little with the production of the albumen print. When I ventured the query, Why? the answer has usually been: Our operator can turn out enough work with the easier albumen process. This may be true; but if so little opportunity is given to our apprentices to learn the various processes in photography, where are the experienced experts of the future to come from?

I repeat what I have before stated, that the photographer who is careful to conscientiously eliminate every vestige of hypo out of his prints, and exercises the necessary caution in the selection of his materials, may safely guarantee the stability of his albumen prints,—of course, provided nothing is wrong with the paper, which unfortunately will occur, and is altogether out of the control of the photographer.

With Steinbach paper, as well as that bearing the water-mark "Rives," I have never discovered any fault. Other papers may be just as reliable, but none should be used for photographic purposes until proven to be so beyond doubt.

About the year 1855 I bought a number of fine engravings from the most-renowned art institute in Munich,—pictures which had no connection with photographic baths or processes, and yet they discolored and turned yellow. This first became apparent in one where the glass was broken. I then noticed that where the paper was protected by the mat it had remained perfectly white, but where exposed to the light it had become noticeably yellow. In this case the paper alone was to blame. If similar paper had been used for photographic purposes, and the same result ensued, the blame would have been cast upon the means and materials used in producing the photographic image.

Carbon prints, in which the reproduction of the beauty of a high-class negative is so decidedly superior to a silver print, are of undoubted stability, provided that only such color or pigments are used to color the gelatine whose stability in the light has been proven. It was with the object in view, to supplant the wholesale production of albumen prints, that pigments were used which would reproduce the favorite tints of the albumen prints. To achieve this object pigments were requisite which were not permanent, and seemingly faded still more rapidly and assumed a dirty shade when used with gelatine than when used with albumen. Thereby the manufacturers of pigment papers committed a grievous error, and placed a weapon in the hands of the enemies of the carbon process, and such photographers who opposed any substitute for the albumen process, with which the introduction of the carbon process was successfully opposed. With permanent pigments beautiful pictures can be made, which well deserve the approval of a critical public. However, any process where the necessary depth of printing cannot be watched will scarcely ever gain the favor of the bulk of professional photographers.

Carbon prints consequently have this in common with the silver print, viz., that the selection of the materials is also responsible for the permanency of the prints.

It has been claimed for platinum prints that they are absolutely permanent. That reduced chloride of silver should not be equally permanent as chloride of platinum still remains to be proven. It is true that hyposulphite of soda does not come into play in fixing the platinotype, and all danger from that source is precluded. I have seen many clear and beautiful platinum prints, but also many which had turned very yellow. Platinum paper is notoriously unstable, and must be used fresh; if this is not done, the result is doubtful and the prints usually useless. Perhaps the poor specimens seen were the result of stale paper, or possibly the cause was that traces of muriatic acid remained in the paper.

Last May I saw an exhibition of platinotypes, of universal excellence and clearness of tone, in a prominent photographic establishment. Several months later I again saw them in the same position. All had not kept equally well; a few had discol-

ored a little, but the majority were unmistakably yellow. Consequently it is also requisite to exercise caution in the manipulation as well as in the selection of materials for platinotypes, if the prints are to remain without change. Such being the case, the much-vaunted platinum process has, as a matter of fact, no advantage over the silver print.

Notwithstanding the beauty of the platinotype, which is acknowledged by photographers in general, the process is used by comparatively few. The cause for this may be that platinum paper is an expensive material, and the process requires much practice before the requisite experience is obtained which alone insures success. The failures are expensive, and cause much loss of time; and furthermore, specially prepared negatives are requisite to produce good results.

Now it is suggested to tone silver prints with platinum, and thus obtain prints with all the characteristics of platinotypes. Here the silver is replaced with platinum; accepted that it is true that platinum chloride gives more permanent prints than silver chloride, then by this method the substitution of platinum for silver would be easy and cheap; further, it does not bring into play a single process with which every photographer is not familiar. The process differs only in the substiuition of a platinum for the gold bath. A platinum bath yields more and keeps longer than a gold bath.

As a fact, the process gives excellent results, and is worthy of the attention of all photographers. In our own practice we use a plain caséin paper.

Platinum toning has been frequently broached, but the experiments usually resulted in measly prints if tried with albumen paper, or flat gray prints on plain salted paper. The cause for these failures was that the baths for sensitizing paper for platinum toning should contain ammoniated argentic nitrate (salpetersaures silberoxyd ammoniak). I never was in favor of such baths, as they do not keep, and are useless for albumenized paper. Still it is convenient to have a bath which will answer for all papers.

I made the trial with caséin paper, sensitized on my regular bath for albumen (1.8) three minutes; then I fumed on both sides

four to five minutes, shortly before use. The result exceeded the expectation. Quick printing, plucky, beautiful tones, brilliant high lights, with the richest scale of half-tones down to the deepest shadows. The paper used was a strong, heavy Steinbach, with a rough surface, notwithstanding which all the finest detail and modulations were present, which added greatly to the artistic effect.

Before toning, the prints must be well washed, until the water does not show the least trace of milkiness. They are then well drained and placed in the platinum-chloride bath. They tone rapidly, after which they are placed in a strong bath of common salt; and from this into the fixing bath hypo 1.6, in which they are to remain twenty-five to thirty minutes. After the fixing I proceed as with silver prints. I place them in the salt baths until, according to the chewing test, there is no by-taste. These saline baths act well, and strengthen the tone of platinum as well as silver prints. Another matter which has a tendency to improve the prints is a rapid drying after a thorough washing. In mounting a rapid drying by gentle heat also tends to act as an advantage.

It is remarkable how indifferent the majority of photographers on the continent are to the fuming of sensitized paper, in view of the great advantages to be gained with so little trouble and loss of time. Fumed papers are much more sensitive and copy in less time than the plain. The prints are as strong with the use of a weak silver bath 1.12 to 1.16, as the unfumed sensitized on a concentrated bath 1.10 to 1.8. The prints on the former have a finer detail and shades in the half-tones, and details often lost come out here in all their beauty.

Ready sensitized paper only gives good results if fumed with ammonia. The prints then are equal to freshly sensitized paper.

This paper is of great advantage to smaller photographic establishments, as it is possible to prepare a quantity of paper in advance. This saves time and trouble. The following formula has proved the most reliable in my experience, and seems to be of special trustworthiness, and deserves the attention of the practical photographer. The paper is floated for two or three minutes on a solution of

Nitrate of silver	100 grams.
Citric acid	100 grams.
Water	1,200 c.c.
Alcohol	100 c.c.

After each sheet has been sensitized, 10 c.c. of the following solution are added to the bath:

Nitrate of silver	20 grams.
Citric acid	12 grams.
Water	200 c.c.
Alcohol	20 c.c.

When removed from the bath, the paper is drawn over a glass rod, and, after draining, placed with the sensitized surface on chemically pure blotting-paper. It is then covered on its back with a sheet of stout paper, and well and evenly wiped off by powerful rubbing and pressing. Finally it is dried spontaneously in the dark. If placed between preserving paper it will keep for from six to eight weeks in summer, and for months in winter. The preserving paper consists of soft, very thick, unsized blotting-paper of white color, which should be entirely free from wood, chemically pure, and saturated with carbonate of soda. It should be used in rolls of from five to six metres length, and kept, together with the sensitized paper, in pasteboard or tin boxes.

Uranium Intensifier.—Mr. L. Schrank, editor of the *Photographische Correspondenz*, recommends the following intensifier as thoroughly trustworthy, especially in the case of negatives destined for zincography, and for the platinotype process:

SOLUTION A.

Nitrate of uranium	7 parts.
Glacial acetic acid	7 "
Water	280 "

SOLUTION B.

Ferricyanide of potassium	7 parts.
Glacial acetic acid	7 "
Water	280 "

The solutions are poured over the plate in succession. The negative treated with this intensifier acquires a brownish-red color, which is of great covering power.

FOCUSING.

BY XANTHUS SMITH.

THERE is a good deal being said from time to time upon the subject of what is called focusing in photography, and while to the every-day worker it seems a matter of little import, simply because, in aiming after a good, well-defined picture, he always gets a clear, sharp image on the ground glass before exposing, there are a good many who are not so clear upon the subject. Beginners, we notice, for instance, are not always aware of the importance of a very sharply defined image being secured before they make their attempt with the plate ; and there are some very advanced workers who, through a mistaken idea that they are dealing with a fine art when they are taking photographic views, are mystifying themselves, and are likely to mystify others, with the notion that a landscape photograph must be taken out of focus in some part in order to lift it out of common photography and make it a work of high art.

It must always be remembered that a photograph can never be anything but a photograph. It is the result of a means of portraying anything in nature which is open to any one. A schoolboy, after a few trials, may make just as good a photograph as a man who has devoted years to the pursuit, while in any of the branches of the fine arts the gift of the power to produce a work of art is bestowed upon a very few, and then it is only after years of patient study and practice that the power is able to manifest itself in a remarkable way. The camera conveys faithfully what is presented to it as a mere machine. It cannot build up, emphasize, or subdue ; and if we rob it of its exquisite power of mechanism in giving us an infinite amount of refined detail, by throwing it in part out of focus, we destroy the supreme power with which it is gifted.

No one can appreciate more fully than the writer does the artistic advantage to be derived from a subduing of certain passages in landscape views. Indeed, it may be said that there is no

soul or poetry in an extended landscape scene unless there be present some haze, or what painters call atmosphere, to blot out the detail of receding degrees of distance. But in working with a camera the advantages of this condition can never be attained by putting the distance out of focus. If we take a view, for instance, on a day when the atmosphere is perfectly clear and objects miles off appear as strong in color and as full of detail as those at our feet, it is impossible to improve our picture by having any portion of it out of focus. It will only appear as a heavy, blurred streak, and will instantly give the impression that something is wrong with the work. While, on the other hand, if there be a sufficiency of atmosphere prevailing to make the view agreeable to artists, there will not be any need of tinkering with the focus. Nature does the work on such occasions, and we have merely to copy her. We cannot imagine a condition when it would be possible to improve an extended landscape view by having the foreground out of focus. Of course, if it should be the misfortune of any one to be off on a trip without stops for their lens, it would become necessary for them to discriminate in taking their views where they should accentuate the focus, and we should say let it be upon the most important or interesting passage of the view; but we feel confident that the resultant work would not be equal to what it would had they been provided with stops and had a good lens in working order.

In painted landscape scenes good artists subdue their distances, and attain perspective by a softening of the tint, at the same time maintaining all the delicate detail finish of which they are capable; and if they should be painting when there is an absence of haziness, they do not attempt to gain an appearance of distance by daubing on the stronger hues in utter disregard of all detail,—such a mode could never produce an agreeable finished work. In conversing with a friend lately, upon the subject of throwing a portion of the view out of focus, he expressed an idea which is certainly very true, namely, that in looking at a scene in nature we have everywhere the details before us in all their perfection, but we only see them at the particular point which is claiming our attention for the moment, and the case is much the same in

looking at a photograph. Let the detail be good all over, and the eyes will find satisfaction at whatever particular point they may look for it, without being disturbed by that which surrounds.

We hope that it will be clearly understood that what we have written is solely in relation to landscape scenes. In rustic bits and in figure pieces and portrait work it may often not be objectionable to leave whatever may form the background out of focus, because, instead of the portrayal of an entire scene, we have simply a feature or one or two important objects which form the principal aim of our work, and we consequently wish to accentuate the attention upon them. In fact, as they form the picture, they must be in sharp focus at the expense of all else; but it must not be considered that any kind of background may be subdued and thrown into place simply by having it out of focus. Ill-shapen and sharply relieved patches of light and dark will thrust themselves obtrusively upon the eye, to the detriment of anything that may be placed in front of them, and it matters little whether they be in focus or out of focus. Backgrounds should invariably be quiet, and if a background be in every way in harmony with the subject that it backs up, and of subdued tones and agreeable forms, the picture will be none the less good if it be in focus as well as the principal features. It has not been our intention here to discuss the subject of the use of stops. We think that it is very much a matter of individual taste as to whether a lens is to be used stopped down to the last point or not. In our own practice we consider that, as in many other matters, a medium course is the best, and that simply a sufficiently small stop should be used to secure good definition all over the work.

Mrs. Frederick W. H. Myers, sister of Mrs. Dorothy Tennant Stanley, is an amateur photographer, and takes remarkably fine pictures. They are large, and are printed on unglazed paper. They are pictures resembling copies from the old masters. Besides the wonderful portraits Mrs. Myers has taken are many fancy pictures, children posing as Cupids and young women as goddesses, which are very much like the Bartolozzi engravings, now the rage. They have all the softness and ivory-like finish of those celebrated prints.—*Public Ledger*.

THE FACULTY OF OBSERVATION.¹

BY J. GALE.

PHOTOGRAPHY, if it had no other advantage, is invaluable in cultivating the faculty of observation. We most of us think that when we look at a thing we see it all; there never was greater mistake. What you see depends upon how you look, and, if you mean to excel *animus tuus ego*, you must "mind your eye"; and to mind your eye your mind must be *in* your eye.

Nature, looked at with the trained eye of the observant man, is a very different thing from the casual glance of untutored sight bestowed upon it by the unobservant man; to him an infinity of subtle detail full of beauty has no meaning, and having no data to enable him to investigate or distinguish the effects before him, he will see with prosaic eye things only in the lump. He can never see nature with that inner sight which, appealing to the understanding and the heart, opens out new fields for analysis and study, and transforms nature in those ideal representations which are the *perfection of art*. Only think of the wonderful power of concentration, to say nothing of the feat of memory, manifested by Turner in his picture of the "Snowstorm" in the National Gallery. He tells us that he went out to sea in a fishing-smack from Harwich, and got the sailors to lash him to the mast of the vessel; and there he remained for four hours watching the storm. How perfect must have been the training of that mental vision which could store up in the memory such effects under such extraordinary conditions, and reproduce them at leisure in the studio.

In landscape photography, a ready and facile judgment of the many considerations that go to the making of a picture can be arrived at only after long, careful, and practiced training of eye and observation. Cultivate, then, this faculty of observation. Observe carefully, that you may see accurately.

By training the faculty of observation he will see at a glance what is worth his attention as matter for the camera, and, more-

¹ Extract from a paper read before the London Camera Club, Nov. 6th, 1890.

over, with all these varieties of occupations and conditions for study, he is not the man likely to perpetrate incongruities such as we frequently see in the works of the non-observants when they turn their attention and their hands to subjects with which they have little or no acquaintance.

To produce a good negative is, nowadays, the easiest thing in the world; but to produce one that shall represent nature in all her phases and conditions (as far as is capable by photography) as she appeared at the time of taking the view, is what we should aim at.

That this may be done—that it is sometimes done—I have no doubt; but to do it uniformly, and at will, will require great observation, an excellent memory, and the exactest care in the dark room and the subsequent printing.

I have alluded to the care and observation required in the lighting of our pictures, and, in further illustration of this part of my subject, it should be particularly remembered that we are working in monochrome. One main element of success in your art will depend on the way in which you can transpose the values of color by the values of monochrome. For instance, you have, perhaps, before you a field of corn with a setting of trees and hedges in full leaf; take this landscape in early summer, when the corn is green, and you will find there is hardly any difference in your picture between the corn and the trees. But take the same landscape in autumn, when the corn is brown and the reaper is there in his shirt-sleeves, with perhaps his children playing about, and you will find that your hedges and trees and corn all drop into their proper values of monochrome, and will represent, as nearly as possible as monochrome can, the values of color.

A close study of nature, and large experience in the practice of this part of photography, will alone enable us to overcome the difficulties and make us masters of the art.

In conclusion, let me say, make use of every opportunity of studying nature. The expression is becoming strangely hackneyed. Everybody thinks, nowadays, that he is a student of nature, even when he has no idea what the term means,—fancying, perhaps, that it means running about over England or

Europe in search of fine scenery, when the first things required to be noticed may probably be within view outside the back door. Look about you during your swift railway journey to and from town, or anywhere else; observe the difference between morning and evening light; notice the values of the lights and shades on a sunny day, a sunless day, or a foggy day.

Note in fine weather how the receding planes of a landscape reveal distinct atmospheric effects, plane receding behind plane, differing altogether from the effects produced in less settled or stormy weather, when the distant objects toward sunset are sometimes as sharply silhouetted as the near objects.

Let me repeat that you have to translate from the rich and ornate language of color into the somewhat prosaic one of monochrome. Supposing that you have chosen your subject in other respects ever so judiciously, you may spoil it completely by neglecting this important point.

Start for your ramble in the country with a definite object; it is useless wandering aimlessly about, taking haphazard anything that may present itself. Better far start with some definite object in view, or one of a store of subjects previously considered carefully,—one studied and now selected from many in your mind's portfolio, and which has only waited for the weather and the time.

In these days of magazine and rapid-firing rifles, one of the most important points impressed upon our soldiers is "*fire discipline*." So with our magazine cameras and rapid-firing apparatus, let us be careful that we reserve *our fire* until we have something definite to aim at, and never fire unless there is a reasonable probability of hitting.

Don't leave "*pretty well*" alone; if there is anything to be done to improve the view, do it; make the best you can of your subject and with the materials at hand.

Do only as much as you can complete yourself without extraneous aid. If you are in love with your art and your subject (and if you are not—*cui bono?*), you will tenderly and lovingly take a pleasure in completing the work from beginning to end; you will not send the plate to the maker to be developed, and your negative to the professional printer, or your skillful friend, to

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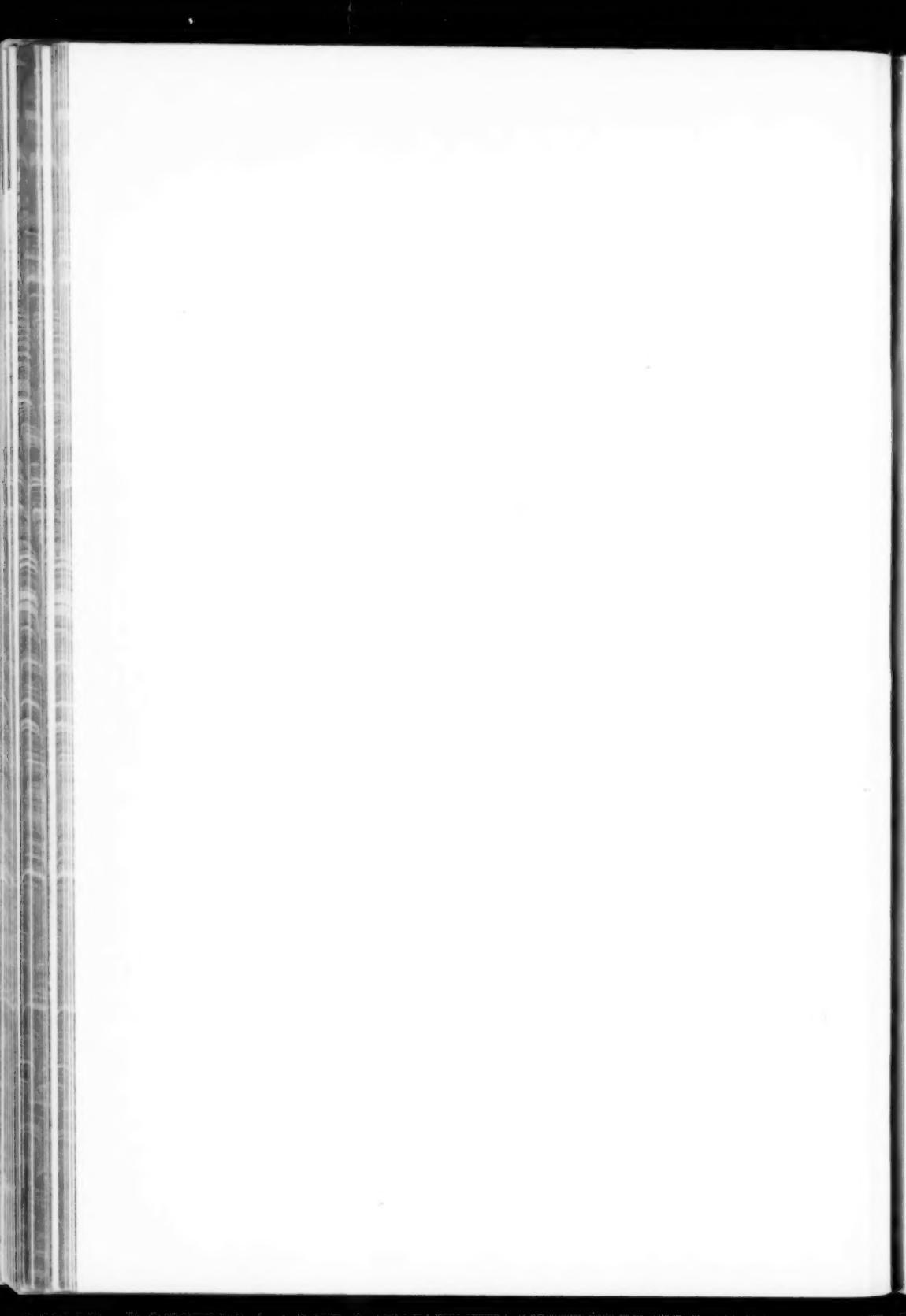
FEBRUARY, 1891.



CLEOPATRA.

"For her own person,
It beggar'd all description."

Antony and Cleopatra. Act. ii. Scene 2.



be printed. To those with whom such a practice is a necessity I say nothing, except that they must not call the result their own work. But to adopt such a method, and then send the pictures to an exhibition as your work, reminds one irresistibly of one of those miserable mendicants one sees in the public streets: there he sits, cowering on the pavement, alongside of a set of wonderful productions in colored chalk, craving alms, gulling the passers-by with the belief that he was the talented artist; while the truth is that the real operator has been doing half a dozen others for a like number of similarly helpless wretches, and is now away at the "Pig and Whistle," enjoying his beefsteak and onions and his pot of "arf-and-arf."

PHOTOGRAPHY IN THE COLORS OF NATURE.

BY F. E. IVES.

IN the interesting lecture delivered before the Franklin Institute, in Philadelphia, December 19th, 1890, Mr. Ives, after an exhaustive introduction relating to the experiments in heliochromy by the chloride of silver process, went on to state:

In my opinion, the first step towards the solution of this problem was taken by Henry Collen, Queen Victoria's painting master, who, in 1865, invented a plan of composite heliochromy. His plan was based upon a false conception of the nature of color, and means for carrying it out were then unknown; but it was a bright idea, and contained the germ of a successful process. Collen's original communication of his idea appeared in the *British Journal of Photography*, October 27th, 1865, and reads as follows:

"It occurred to me this morning that if substances were discovered sensitive only to the primary colors,—that is, one substance to each color,—it would be possible to obtain photographs with the tints as in nature by some such means as the following:

"Obtain a negative sensitive to the blue rays only, obtain a second negative sensitive to the red rays only, and a third sensitive to the yellow rays only.

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"There will thus have been three plates obtained for printing in colors, and each plate having extracted all its own peculiar color from every part of the subject in which it has been combined with the other two colors, and being in a certain degree analogous to the tones used in chromo-lithography. Now it is evident that if a surface be prepared for a positive picture, sensitive to yellow rays only, and that the two negatives, sensitive only to blue and red, be superimposed either on the other, and be laid on this surface, the action of light will be to give all the yellow existing in the subject, and if this process be repeated on other surfaces sensitive only to red or blue, respectively, there will have been produced three pictures of a colored object, each of which contains a primitive color reflected from that object.

"Now, supposing the first great object achieved, viz., the discovery of substances or preparations, each having sensitiveness to each of the primary colors only, it will not be difficult to imagine that the negatives being received on the surface of a material quite transparent and extremely thin, and that being so obtained are used as above,—*i.e.*, each pair of superimposed negatives to obtain the color of the third,—that three positives will be obtained, each representing a considerable portion of the form of the object, but only one primary of the decomposed color of it. Now if these three positives be received on the same kind of material as that used for the negatives, and be then laid the one on the other, with true coincidence as to the form, and all be laid upon a white surface, it will not be difficult to imagine that the effect would be not only the representation of the form of the object, but that of its color also, in all its compounds.

"Although the idea I have endeavored to express in words may be utterly worthless, I am unwilling to let it slip away without notice, as it may on the other hand contain a germ which may grow and bear fruit in due season."

The language of some parts of this communication is ambiguous; but, taken all together, with due allowance for the writer's unfamiliarity with photographic technology, it clearly amounts to a suggestion to make three photographic negatives of an object,

—one by the action of red light, one by yellow, one by blue; to print from each pair of these negatives (superposed as one) a transparent positive having the color represented by the third negative, and to superpose on a white surface the three prints thus obtained.

It was not possible to carry out Collen's suggestion at that time, because there was no known process by which plates could be prepared which were sensitive to single colors only, and no photographic plates were sensitive enough to red and yellow to admit of the production of such negatives by exposure through selective color screens. Had it been possible to carry it out, the results must have been very imperfect, not only because the entire procedure is based upon a false and misleading theory of color, but also because superposing two negatives to act as one would double the intensity of such parts as represented white, gray, or pale-colored objects, with the result that if the color prints were made to show all the details of the negatives, the finished heliochromes would show all bright colors, as if mixed with equal parts of black pigment.

On November 23d, 1868, Ducos Duhauron, of Paris, applied for a patent¹ for a process which differed from Collen's only in the manner of carrying out the same idea. Like Collen, he assumed that the spectrum is made up of three primary color rays and mixtures thereof. He said: "My procedure rests on the principle that the simple colors are limited to three,—the red, the yellow, and the blue,—the combination of which in divers proportions produces the infinite variety of shades in nature." Like Collen, he expected to solve the problem by superposing red, yellow, and blue prints taken from negatives made by yellow and blue, red and blue, and yellow and red light. But, instead of using plates sensitive to single colors only, he proposed to use plates sensitive to all colors, and to prevent the action of color rays not wanted by filtering them out with color screens placed in front of the photographic objective or sensitive plate; and, instead of superposing to negatives to act as one, from which to make the color prints, he proposed to make two colors (two-

¹ Class XVII., Sec. 3, Serial No. 83,061.

thirds of the spectrum rays) act to produce each negative, which amounts to the same thing, and would not obviate the defect I have mentioned as resulting from the doubling of intensity on uncolored objects. He proposed to make one negative through an "orange screen, calculated to absorb the blue light and transmit the red and yellow; one through a "violet" screen, calculated to absorb the yellow light and transmit the blue and red; one through a "green" screen, calculated to absorb the red light and transmit the yellow and blue.

It was no more possible to carry out this idea in Duhauron's way in 1868 than to carry it out in Collen's way in 1865. It is true Duhauron tried to carry it out, and showed specimens of work, but the red and yellow rays did not act on his sensitive plates,² and he admitted, in a communication to the French Photographic Society,³ that "the production of good results will . . . involve the manufacture of compounds which have not yet been created."

Soon after Duhauron showed his first specimens, Charles Cros, of Paris, published another modification of Collen's plan.⁴ Like Collen, Cros proposed to make one negative by the action of red light, one by yellow, and one by blue; but by exposing the sensitive plates through red, yellow, and blue screens, instead of employing plates sensitive to single colors only. Instead of superposing each pair of these negatives to make each color print, he proposed to make a green print from the negative made by red light, a violet print from the negative made by yellow light, and an orange print from the negative made by blue light. He also suggested that ordinary positive prints made from these negatives might be illuminated each by the kind of light which it represented, and the three combined by the aid of suitable optical devices so as to form a single picture, showing all the colors. Cros's plan, although it could not succeed because based upon the same false and misleading theory as that accepted by Collen and Duhauron, nevertheless possessed one important

² Yellow pigments were photographed by the green rays which they reflected.

³ *Photo. News*, 1869, p. 319.

⁴ Described in *Photo. News*, Oct. 8th, 1869, p. 483.

advantage over the preceding methods: it was free from the defect of doubling intensity on those parts of the negatives representing pale or uncolored objects. But this advantage would be lost again in the production of green, violet, and orange-colored prints, which will combine to reproduce yellows and blues only with a degree of degradation comparable to that produced by Duhauron's method.

On December 3d, 1869, M. Poirée, of Paris, in a communication to the Photographic Society of France,⁵ expressed doubts concerning the correctness of Duhauron's and Cros's theories, and suggested that better results might be had by making a greater number of negatives,—a separate negative for each spectrum region. He said: "The process which seems likely to succeed best is that in which the colors are analyzed by isolating successively each ray, or at least the rays of the same shade. . . . This analysis is difficult to make with colored glasses. It might be done, as by Newton, by monochromatic lighting and successive exposures to simple rays of the same shade. . . . The synthesis is made by means of black positive images and rays of the same nature as those which produced the corresponding negatives. . . . It will then only be necessary to place one above another the colored images so obtained, so as to form one virtually and really. It will be identical with the model, because it will be formed by the same rays, in the same relation of intensity." This plan also could not then be carried out, because no photographic sensitive plates were sufficiently sensitive to yellow, orange, and red spectrum rays.

In 1873 Dr. H. W. Vogel discovered that bromide of silver can be made sensitive to the less refrangible spectrum rays by treatment with certain dyes, and the subsequent discovery of other and better color sensitizers supplied the means for carrying out either Collen's or Poirée's idea.

Duhauron, one of the first to avail himself of these discoveries, made some practical progress, and, in 1876, abandoned Brewster's color theory, and patented a modified process,⁶ based upon

⁵ *British Journal of Photography*, 1870, p. 26.

⁶ British patent, July 22d, 1876, No. 2,973.

the observation that, while there appeared to be *seven* "principal" spectrum colors, three coloring substances would "serve to express them." The coloring substances he named for this purpose are blue, carmine, and yellow, and he decided that, in order to make such a process reproduce the colors of nature, the negatives should be made by the action of orange, green, and violet spectrum rays, which are complementary to the coloring substances. Some persons have thought that he had the idea of making negatives to represent primary color sensations; but this supposition is negatived, not only by the absence of any declaration to that effect, but also by the fact that orange does not represent a primary color sensation, either in fact or according to any theory recorded in the text-books, and the violet rays are not the ones which most powerfully excite the blue (violet) sensation. The plan was also utterly indefinite as regards the relative effect of intermediate spectrum rays, and Duhauron himself, owing to the fact that he never tried the method upon the spectrum, had no accurate knowledge of its capabilities. In his latest and "perfected" process (1878),⁷ he employed no plate sensitive to either red or orange light; one negative was made chiefly by yellow light, another by green, and the third chiefly by violet and invisible ultra-violet rays.

Albert, of Munich, also took advantage of the discovery of color sensitizers to carry out Collen's principle according to Duhauron's original plan. He was the first to make the color prints by the collotype process, which led to the use of the term "chromo-collotype."

In 1879 Cros⁸ abandoned the idea that red, yellow, and blue are primary spectrum colors, but still held that there are three primary colors and mixtures thereof, and that these primary colors are orange, green, and violet. Like Duhauron, he decided to make negatives by light of these colors and prints in blue, red, and yellow.

In 1888—Dr. F. Stolze, of Berlin, made a series of investiga-

⁷ "Traité Pratique de Photographie des Couleurs," Paris, 1878, *Photo. News*, 1878, p. 115.

⁸ *Bulletin of the French Photographic Society*, 1879, p. 23.

tions, and tried to solve the problem by devising a procedure more in accordance with Young's theory of color.⁹ He said: "Although the colors correspond with certain external processes in nature, there is also no doubt that color as such is nothing objective, but a subjective sensation, based upon the peculiar irritation of the visual nerves by these external proceedings. We can, therefore, only hope to produce a picture in natural colors when we are enabled to produce upon the same the proceedings which furnish to us the color impression." "The general idea of all colors being based upon the three principal colors, red, yellow, and blue, is an erroneous one." "Theodore Young . . . assumes that there are three kinds of nerve-fibres sensible to red, green, and violet. Objective homogeneous light excites all three; but with red the first is excited strongly, the second and third weakly; with blue, the second and third moderately strong, the first weakly; with violet, finally, the third strongly, and the first and second weakly. If all three kinds of nerve-fibres are equally strongly excited, the impression of white light will take place."

This theory, in accordance with which Dr. Stolze tried to devise a theoretical solution of the problem, is only partly correct, measurements by Clerk Maxwell and others have shown that the "red" sensation is neither affected by blue-green, blue, or violet rays, nor the "blue" (violet) sensation by red, orange, or yellow rays, nor the "green" sensation by red or violet rays. Neither is it the red rays that chiefly excite the red sensation, nor the violet rays that chiefly excite the blue (violet) sensation.

As a result of elaborate calculations, which, it must be said, could just as well have been made without any reference to Young's theory of color, Dr. Stolze came to the conclusion that if three suitable selective color screens were used in connection with color-sensitive plates, three negatives of the spectrum might be obtained, from which prints in cyan blue, carmine, and yellow, if superposed, would reproduce the color effect of the spectrum. He did not show how to make selective color screens calculated to secure the right kind of negatives to carry out this idea, nor state what should be the form of the intensity curves in such

⁹ *Photographic Bulletin*, 1888, pp. 516, 555, 588, 647, 678.

negatives of the spectrum. He merely gave a table, showing on what parts of the spectrum each negative should fix color, and said: "If successful . . . in selecting the color screens in such a manner that they will let the colors pass through which are called for in this table, one will indeed be able to reproduce a pure spectrum in this way." By further calculations, he was able to show that this plan, even if successfully carried out, would not insure the correct reproduction of mixed colors. He said: "All pure saturated spectrum colors will also be obtained quite satisfactorily in the reproduction, but the mixed ones only partly." "Oftentimes they have to become more or less impure." "But the clearest lights and a number of mixed colors appear very unsatisfactory." He added: "The intelligent support of the artist can lend improvement," and recommended also the production of a fourth (ordinary) negative, to be used in combination with the others, to modify the effect, especially in the high lights.

This plan cannot be said to definitely represent the application of Young's theory of color but it may be practically better than anything that that theory would indicate, if we leave out of account the suggestion of a fourth negative.

In 1885 Dr. Vogel published a plan which is a modification of Poirée's.¹⁰ Like Poirée, he proposed to make a separate negative for each spectrum region; but, instead of using plates sensitive to all colors and exposing through selective color screens, or illuminating the subject by monochromatic lights, Vogel proposed to sensitize plates specially for each spectrum region, which would amount to the same thing; and instead of projecting the pictures with colored lights, he proposed to make as many pigment prints as negatives, each in a color complementary to the light which acted to produce the respective negative, and to superpose them as in the Collen method.

There are no known dyes with which this plan could be carried out, and even if there were, it is, I believe, too complicated to be practicable.

(*To be continued.*)

¹⁰ *Annalen der Physik* (N. S.), XXVII., p. 130; *Photo. News*, 1887, p. 568.

HELIОCHROMY.¹

BY D. WISTANLEY.

I AM a "great believer" in photography in colors, and I am so because I have great reasons for belief. I have seen photographs in colors produced by Captain Abney. I have produced photographs in colors myself twenty-four years ago, and I have one on the table now beside me which I have only just taken from the frame, and which has occupied the last three days in its production by means which I shall presently describe.

I have read a good deal lately on the subject of heliochromy in the past records of our art, and a good deal of what I have read surprises me. I have not yet got my mind into the curious condition into which Mr. Joseph Wilson Swan had managed to get his when he wrote an article on this subject for the "Year Book of Photography" for 1870, and which commences on page 47 of that work. In that article Mr. Swan says: "It is possible to produce a photograph of the solar spectrum more or less colored with the real colors of the spectrum. I believe," he continues, "Mons. Claudet once showed me a plate with such a photograph upon it. Certainly I have seen one somewhere." And yet the object of his article, he says, is "not only not to raise and nourish false hopes, but to dissipate and kill them." Mr. Swan was of opinion that "we have made no more approach to the realization of the indispensable conditions" of photography in colors "than we have to the discovery of the philosopher's stone," and though he did "not say that the discovery of either the one or the other is an impossibility," he did "regard the pursuit of each of these objects as equally visionary." The reader will be puzzled to guess upon what ground a gentleman who has

¹ This article upon the subject of heliochromy, by the late Mr. D. Wistanley, published in the current issue of *Photography*, was written but a few days before his death, and derives a somewhat pathetic and romantic interest from the concluding lines.

In view of the universal attention which the subject of heliochromy has attracted of late, in Europe and America, we print the paper in full. It will be found of additional interest when compared with the communication from Mr. Fred. E. Ives, who has gone so far towards solving the problem on a diametrically opposite course.

"certainly seen" a "photograph of the solar spectrum more or less colored with the real colors of the spectrum" should affirm that we are no nearer the discovery of heliochromy than we are to that of the philosopher's stone. And this is the reason given by Mr. Swan: "I look upon the colors in those photographs as produced by certain degrees of actinic action, and only connected by accident with a corresponding color in the object represented where such correspondence exists." Mr. Swan's reason, then, for believing we are as far from heliochromy as from the philosopher's stone is briefly because he thinks something which obviously might be, and which I say experiment proves to be, untrue. Photographing the solar spectrum in colors more or less like those of the original is not a new thing by any means. Ritter did this in 1801. Seebeck successfully repeated the experiment in 1810. Herschel, in 1839, found that the "spectrum impressed upon a paper spread with chloride of silver is often beautifully tinted, giving, when the sunshine has been favorable, a range of colors very nearly corresponding with the natural hues of the prismatic spectrum." "Daguerre noticed" (I quote from Garrison's "History of Photography," p. 117) "that a red house gave a reddish image on his iodized silver plates in the camera, and at an equally early date Fox-Talbot observed that the red portions of a colored print were copied of a red color on paper prepared with chloride of silver."

Hunt, Becquerel, Poitevin, Niepce de St. Victor, St. Florent, and others have obtained similar results, and so has Captain Abney, who obtained them by exposing silver plates to the action of the spectrum, either whilst dipped or after dipping in hydrogen peroxide.

I think, however, that all these experiments with the solar spectrum are experiments in the wrong direction, for in making photographs of such objects as we see around we very seldom, indeed, have pure spectrum colors with which to deal. The thing which looks red only does so because it reflects more of the red rays than of the rays of other colors; the thing which looks green because it reflects more of the green rays, and so on. I know of no substance whatsoever which does not reflect white

light; black velvet certainly does, though, of course, to only a very small extent indeed; and we may take it that the rays proceeding from any object by reflection, whatever the seeming color of the object, are in part composed of pure white light which dilutes and brightens the preponderating ray. To be able to take photographs in natural colors—*i.e.*, photographs of anything we see—we must be able to do so by means of the preponderating ray even in the presence of all the others. Hence, though photographs of the spectrum have (to my thinking) demonstrated the possibility of making photographs in colors, it is perhaps useless to pursue the subject further in that direction.

At first sight it seems quite hopeless to expect that we shall ever be able to eliminate the results of all those colors which are not evident to the eye, but I hope to show that it is not merely otherwise than hopeless, but that it is actually easy. Everything is easy when you only know the way, and blessed is the man who can so use his reason rightly as to see the facts of science unmixed with the fictions by which they are hedged in and surrounded,—blessed in the sense that he is likely to get understanding.

But let me get "down" to the tangible ground of observation and experiment. Many methods are given in Harrison's "History" and elsewhere by which color photographs have been obtained. The simplest method is one described by Hunt, and thus quoted on page 118 of Mr. Harrison's work: "A paper prepared by washing with barium chloride and nitrate of silver, allowed to darken whilst wet to a chocolate color, was placed under a frame containing a red, a yellow, a green, and a blue glass. After a week's exposure to diffused light it became red under the red glass, a dirty yellow under the yellow glass, a dark green under the green, and a light olive under the blue."

It is not obvious to me that it can matter much what base is present in the salting chloride, and having no chloride of barium in the house I proceeded to work on March the 20th [1889] in the following way:

Made a solution of common table salt, forty grains to the ounce. Floated several sheets of common writing paper on it, of the kind I now employ. Floated each sheet for five minutes, and

then dried. Floated them successively for five minutes on a forty-grain solution of argentic nitrate, on which small quantities of albumenized paper had been floated a year before, and exposed them wet upon a horizontal board before a window to the light of day. Placed about a teaspoonful of powdered chocolate on the board, and spread it out for purposes of comparison. As the sheets showed signs of drying, floated them again upon the silver bath, just for a moment, and to wet them merely, as it struck me that the wet condition might be an essential part of the experiment. As the light was very poor (it was afternoon, and raining hard) it took about a couple of hours to bring these silvered papers to the color of the chocolate guide, which, however, they matched quite well. Enclosed these sheets between the blank pages of a note-book. Prepared two printing-frames with such colored glasses as happened to be at hand,—ruby, blue, and iron yellow. Cut off pieces of the silvered sheets (which, by the way, had been allowed to dry spontaneously in the dark), and fixed them in the frames. Exposed these frames in a window, regardless of the fact that the morning sunshine had access thereto, for it does not seem to me to matter about using diffused light only. Examined them with frequency during the next three days, and on the fourth dismounted the one which I have now before me. Result (according to myself and various members of my family): Under the red, pale red, or rose color I should say; under the blue, a copperish green (like the dark patination on an ancient copper coin); under the iron yellow (which is not a yellow at all to an eye which can distinguish colors, but a light variety of brown), the color was dark brown. These colors, which are not everything we want, are decidedly encouraging, and there can be no doubt but any one can get them who will take the very trivial amount of trouble which has been involved. The red is red, and a very beautiful tint of red, and it has not been produced, as Mr. Swan imagined, "by certain degrees of actinic action." The "copperish green" part of the paper never went through the rosy tint at all. I watched it too closely to let it have the chance without my seeing it, and devised another experiment to check that fact should it happen to occur. Where the copperish green prevails

the print is enormously overdone, from a photographer's point of view, and the green shows semblance to metallic lustre. But the experiment, be it remembered, is not yet complete. With the second frame I am awaiting the ultimate result. The picture obtained looks to me like a genuine photograph in pretty near the genuine colors, but hedged in, clouded and surrounded in various degrees by a common photograph in black.

But how shall we separate the two? I think I see the way.

A PHOTOGRAPHIC NOVELTY.

THE following ingenious apparatus has lately been patented in England for "the production and representation of instantaneous photographs":

The pictures are produced upon a sensitive film or surface carried by a long roll of paper or other material.

The roll is continuously unwound from one drum and wound upon another, and in its passage a series of images is successively thrown upon it by a photographic lens. A screen is provided between the lens and the exposed sensitive surface. The screen travels out of the way to permit the image to fall on the sensitive surface, and covers the lens again as soon as the exposure is complete. These operations take place with regularity, and usually great rapidity, so that several pictures are taken in each second during the time that the apparatus remains at work, which will be for many successive seconds, indeed for any length of time which may be desired. The scene selected for photographic presentation will be one of constant movement,—for example, a street scene,—so that each picture will differ slightly from the preceding and succeeding pictures.

The camera may be arranged in the following manner: in the fore part is the lens, and immediately behind the lens the screen, which regulates the instantaneous exposures. The screen may be an endless band passing around pulleys and traveling at high velocity. In the band there are two perforations or apertures, and twice in each rotation of the band these perforations coincide, and the light is then able to pass from the lens through the perforations on to the sensitive surface. The lens forms the scene upon the sensitive surface. The focus is accurately adjusted before commencing the operation by the aid of a

slide on which there is a focusing glass and guide rollers, over which the continuous sensitive paper or material passes.

The screen and the winding apparatus are so geared together that the sensitive surface travels the distance necessary to separate the pictures between one exposure and another. In place of the traveling perforated belt, a disc perforated with a narrow slit, and driven by bevel-wheels, may serve the purpose. After the pictures have been taken, the roll is removed from the camera, and the pictures upon it are developed in the ordinary manner. From this continuous band of negative pictures a similar band of positive pictures is produced, and rendered transparent by the application of vaseline or vaseline oil, or by any other suitable process.

For the exhibition of the pictures, a lantern similar to the ordinary magic lantern—or, if a non-transparent positive band is used, then a lantern similar to the opaque magic lantern is employed, in which a brilliant intermittent electric light is provided. The lantern is provided with condensing and focusing lenses, by the aid of which the light, after having passed through the transparent positive picture, is focused upon a screen. Each picture is thus exhibited only by one flash of the intermittent light, for the band of pictures travels on, and by the time the next flash occurs another picture is in place. Thus several pictures are exhibited upon the screen in each second of time throughout the whole period of exhibition, which will usually be approximately the same as that occupied in taking the pictures. The change from picture to picture and the flashing of the light is so rapid (about seven flashes per second) as not to be discerned by the eye, and the appearance on the screen is that of a picture in which the animate and other objects exhibited are in movement. In order that the flash may synchronize accurately with the picture in position, contact pieces are provided upon the traveling band, and by the passage of these the flashes are determined. Or a continuous light, electric or other, may be used, and the recurring flashes obtained by a perforated screen traveling at high velocity, as in the camera above described, the coincidence of the flashes with the centre of each successive picture being insured by increasing or diminishing the speed of the traveling band of pictures by an arrangement for the insertion or withdrawal of a tapering driving drum, or other appropriate means.

PHOTOGRAPHIC PICTURES ON CELLULOID.

THIS invention relates to an improved process of printing photographic pictures on celluloid or other pyroxylene material, and retaining them securely on the surface of the celluloid without deterioration by dampness or other causes. The photographic pictures, when once fixed on the celluloid surface, are permanent in color and do not fade.

The invention, which is covered by letters-patent, consists of a process of photographic printing on celluloid by first preparing the surface of the celluloid with a solution of gelatine, chrome-alum, water, and acetic acid; then transferring the picture from a tinted and sensitized paper, after the same has been exposed to the light in the negative, to the surface of the celluloid; next developing the picture on the surface of the celluloid; and, finally, hardening it by suitable chrome-alum solution, and protecting the picture by a layer of suitable varnish.

In carrying out this method, the surface of the celluloid is prepared with a solution of thirty grams of gelatine, 1,000 grams of water, to which a solution of one-and-a-half grams of chrome-alum in 160 grams of water is added, the solution being acidulated by adding twenty grams of acetic acid.

The paper on which the photographic picture is to be produced is prepared in the following manner: It is coated with a solution of 400 grams of water, from 100 to 130 grams of gelatine, fifteen to twenty grams of soap, twenty to thirty grams of sugar, and four to nine grams of suitable color, the proportion of the ingredients being varied according to temperature. After the paper is dried, the same is sensitized by a solution of thirty grams of bichromate of ammonia in 1,000 grams of water and a few drops of ammonia solution, until the same gradually assumes a straw color. The paper is then dried in a dark room.

After drying, it is exposed on the negative to the action of light, requiring in the shade about five to eight minutes, and in the sun from two to three minutes. After exposure, the paper is placed on the celluloid surface, moistened with ice-cold water, and

then pressed with a rubber rule. The celluloid and paper are then subjected to a pressure for about ten minutes, after which they are placed in warm water, so that the paper can be removed. The picture is then placed in a bath of cold water, and then dried. The last chrome-alum solution serves to fix the picture, while the treatment with warm water serves to develop the same by removing the unlighted and soluble parts of the gelatine. The picture is then coated with a gelatine solution,—the same gelatine solution by which the surface of the celluloid has been first coated. The picture is then hung up for drying, covered with a coating of a suitable varnish,—for instance, of collodion, consisting of equal parts of ether and alcohol, in which a small quantity of gun-cotton has been dissolved. Such a varnish unites with the surface of the celluloid, and forms a good protecting layer for the picture, so that the same cannot peel off or fade.

Why Leaves Change Color.—There are dozens of different theories advanced to account for the fact that leaves in autumn change from their dark summer green to yellow, red, and golden, and innumerable intermediate tints. The following, from an eminent botanist, will, however, be of deep interest to those who have always thought that the red and golden glory we are now enjoying was simply the effect produced by frost: The green matter in the tissues of the leaf is composed of two colors—red and blue. When the sap ceases to flow in autumn, and the natural growth of the tree is stopped, oxidation of the tissues takes place. Under certain conditions the green of the leaf changes to red; under different conditions it takes on a yellow or brown tint. The difference in color is due to the difference in combinations of the original constituents of the tissue, and to the varying conditions of climate, exposure, and soil. There are several things about leaves that even scientists cannot explain. For instance, why one of two trees of the same species growing side by side in the same soil should take on a bright red color in the fall and the other a pale yellow, or why one branch of a tree will turn a beautiful crimson and the one just above or below it turn a dull brown.

Still More Like Him.—Photographer—"Your son, the student, ordered this likeness from me." "It is certainly very much like him. Has he paid for it?" "Not yet." "That is still more like him."—*Fliegende Blätter.*

THE RISE AND FALL OF THE TURKEYTOWN CAMERA AND TRIPOD CLUB.

BY J. FOCUS SNAPPSCHOTTE.

THERE is trouble in "Turkeytown." The usual humdrum quiet of this out-of-the-way settlement is disturbed; dissensions are rife among the inhabitants; men and women who but a few weeks ago were warm friends now do not even speak as they pass by; in most cases, where their gardens adjoin, the potatoes are now dug, or the corn and beans pulled, by the different owners without even a friendly word of recognition across the fence. The village, if it is deserving of the name, but a few weeks ago as peaceful and placid as the neighboring mill-dam in June, is now a sea of discord.

Even the Rev. Sampson Hercules Lamb, the pastor of the "First Independent Protestant Methodist Christian Tabernacle of Turkeytown," now goes sadly along the roads and lanes, with head bowed down and tottering steps,—bowed down by the thought that the seeds of discord had even invaded the sacred portals of his sanctuary, and that now only an array of empty benches greet him when he ascends into the unvarnished pine pulpit, where but a short time ago the dusky countenances and shining eyes of his hearers were wont to listen to his words, and manifest their approval of his exhortations by hearty "amens," "glory hallelujas," and "bress de Lord," etc., which were never wanting, and always sure to gladden the heart of the old preacher, and spur him on to louder and vigorous, if not more erudite, "eighthlys" and "ninthlys" to his generally long sermon. And, worse than all, the Rev. Sampson Hercules Lamb could not restrain the thought that, unwittingly, he had been much the cause of the trouble; and now, with the winter approaching, about a third of his annual salary in arrears (one hundred dollars per year), no coal or wood in the shed, the clothing and shoes to provide for his wife and his eight children, with his flock estranged, and at the present outlook no probability of any of the

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overdue salary being paid, while any remuneration for his present services were out of question, there was nothing but a blank for the future; the prospect looked dark, indeed, for the shepherd of Turkeytown.

The kind reader, without doubt, by this time will say: "What caused all this trouble, and where is Turkeytown?" Well, the hamlet is one of many similar settlements of colored citizens to be found on the slope of the valley hill in Chester county, mostly in the woods, where the cold blasts of winter are kept off by the surrounding sproutland or adjacent hills. Here on the slaty soil, where land is cheap, patches have been cleared, cabins erected, and gardens planted. Numerous settlements of colored people have thus been formed on the hillsides of the Great Valley. Turkeytown is one of these hamlets. The men chiefly support themselves by working for the farmers in the vicinity; while the women whose family cares do not require their presence at home reduce their household expenses to the minimum by going out doing "day's work," as it is called.

These communities are generally quiet and happy, bright-faced children meeting one at every turn. The hamlets are rarely visited by strangers, unless it is that some one of the neighbors wants additional help around the house or farm. The tax-gatherer, of course, makes his usual rounds. With the exception of an occasional visit from the township constable, reinforced by a search-warrant, after missing property (usually chickens), and the regular prayer-meetings at the tabernacle, there was little to break the humdrum monotony of Turkeytown. Now, however, all was changed. There is unity between the brethren and the spiritual leader of the flock no longer. This unfortunate state of affairs came about in the following curious manner, and illustrates forcibly how oft a simple matter may lead to grave and serious results.

It was on a fine, clear day in August last that the sacred precincts of Turkeytown were invaded by a smooth-faced, modest-looking youth, carrying a small canvas-covered case in his hand. The stranger inquired from the first urchin whom he met in the road where the Rev. Mr. Lamb lived. The child gladly piloted the stranger to the house. Mr. Lamb, who was at home and en-

gaged in whitewashing the picket-fence in front of his house, raised up at the approach of the stranger, who proved to be a man of easy address, and at once introduced himself to the preacher by handing him his card, which set forth that he was the authorized agent of the "W. E. Ketchem Photographic Outfit Manufacturing Company, London, Limited," and that he was introducing these outfits to clergymen throughout the United States, and interesting them in the photographic art, whereby the hard-worked and underpaid country parson was enabled to increase his income without a sacrifice of dignity, thus enabling him to live in ease and luxury, where formerly there was nothing but privation and woe.

The glib-tongued youth further went on to say that no one in the congregation would refuse to have their pictures taken by their pastor. The same rule would hold good among his white friends and neighbors, who, if not wanting their own portraits taken, would certainly let him make pictures of their favorite horses, cows, sheep, fat pigs, etc. Besides, everybody wants his house, barn, or place taken. "Why," he went on, "some preachers I have known to make over ten dollars every clear day, besides attending to their parochial duties. They," continued the glib-tongued tempter, "take their outfits with them when they go out to visit during the daytime and take the exposures; in the evening they develop the plates. That is so easy that your little son or daughter can do it if you have no time. Then on rainy days they print the pictures, and deliver them at their leisure. See how easy it is to increase your income, simply from the fact that you are a clergyman." During all this time the Rev. Sampson Hercules Lamb had listened, first with doubt, but afterwards with rapt attention, at the bright picture drawn by the wily stranger. Yet, as he thought how good it would be if he could thus supplement his scanty income, the thought came into his mind, Could he do it? He frankly told the stranger that he knew nothing about the art. The truth was that the only experience our simple-minded preacher had in the field of art was the decorating of a building or fence with a mixture of "Cedar Hollow" lime in a bucket full of water, and laid on broadcast with

a good wide brush, usually in the spring of the year. The tempter, however, was ready for the emergency, and at once removed the doubts of the prospective victim by telling him that no previous knowledge was necessary, and, to cap the climax, said: "I will show you how easy it is done with our automatic, instantaneous, double-hinged, back-swing outfit." Suiting his actions to his words, he opened his case and set up his tripod and camera. The parson, now more intent than ever, called out such of his family as were not already gaping in open-mouthed wonder. The nine were quickly arranged in a semi-circle in front of the humble home,—the parson, as may be surmised, assuming a prominent pose in the centre. In less time than it takes to tell, the focus was adjusted, the slide drawn, the cap taken off and replaced by the wily tempter, who now told the parson that he would develop the plate, and in a few days send him a sample print, together with a circular of the great "W. E. Ketchem Mfg. Co." giving full instructions how he could make anything from a "postage-stamp tintype" to a life-size crayon portrait without further instructions, provided he had their celebrated 4x5 outfit. This they would send him, as he was a clergyman, for twenty dollars; to others the price was one hundred dollars, net cash.

By this time there was not a woman or child in Turkeytown but who had arrived at the parson's yard, looking on in awe and wonder at what was going on within the limits of the picket-fence. The eight children of the Lambs for the first time became the envied of every urchin in the sacred precincts of Turkeytown.

The suave agent now took his leave; he charged nothing, but he had sowed his seed. That night the Reverend Sampson Lamb courted the goddess of sleep in vain. His fevered brain was racked by the fear that perhaps the visions of wealth that arose before him were but a dream, to be dispelled with the first glimmer of the breaking day. To add to his anxiety, the next few days passed without any word from the agent. Some of the people told the preacher they were sure that the smooth-tongued young man was a sharper in disguise. One old mother in Israel

even gave it as her opinion that she was sure that the man was a young doctor student, and had ulterior designs on some of the younger Lambs. However, all speculation ended on the fourth day, when the postmaster at the cross-roads store sent word that there was some important mail matter, directed to his address, in the Gobblerville post-office. The news somehow soon spread through Turkeytown, and, strange to relate, when the dominie reached the post-office there were no less than fifteen of his townsmen there already, with several others to hear from who were on the road. The package for the parson proved to be a large, formidable-looking parcel, bearing the imprint of the "W. E. Ketchem Manufacturing Company." On being opened, it disclosed to the parson's gaze a well-mounted print from the negative made by the designing agent. His joy knew no bounds, so hurrying home as soon as he could get the print from the Turkeyowners who had come there to gratify their curiosity, he called his helpmate from the washtub. The picture was quickly produced and shown to the wife and such of the junior Lambs as were about the house. There was no mistake; there was the Rev. Sampson, his stout wife, and all the little grinning pickaninies, with the whites of their eyes, shining teeth, and kinky hair, all true to nature.

(*To be continued.*)

INK FOR STAMPING OR PRINTING.

MOST of the inks used for typewriting, ticket-printing, cash-registering, or similar small printing appliances, as well as for rubber-stamps, are composed of glycerine, holding aniline colors in solution.

Glycerine, however, although one of the best-known solvents for the aniline colors and a non-drier, is perfectly soluble in water and very susceptible to atmospheric moisture, so that the ink when on the printing device is affected by the relative dryness or moisture of the air, which is a constant element of irregularity in the inking and printing action, causing the ink to print too freely, as if too much inked, on a

moist day, and to print too feebly, as if insufficiently inked, on a very dry day, which becomes quite objectionable in typewriting and similar machines. Another serious objection is that as both the vehicle and the pigment of the ink are intensely soluble in water, the ink does not dry or set quickly on the paper, and will smudge or blur very easily in contact with any moisture, or with the fingers of the manipulator. These objections have recently created a strong demand for an ink which will entirely dispense with the glycerine vehicle, or any vehicle soluble in water or affected by atmospheric moisture, and which will yet hold the coloring matter in absolute solution.

In making the improved ink, either crude or purified oleic acid is used, and the color stirred into the same either in powder, lump, or granular form, and left to dissolve, stirring occasionally until the solution is perfected. The oleic acid may sometimes be heated to nearly the boiling-point of water in a water or steam-jacketed kettle, and the coloring matter may be introduced and dissolved in the hot oil, which will make the solution a little better and more rapidly; but the solution can be made nearly as well in the cold.

One ounce avoirdupois of the coloring matter is used to four fluid ounces of the oleic acid, all of which will be dissolved; but of course a greater or less quantity of the color can be used, according to the strength of the ink desired.

The oleic acid has greater solvent power on methyl violet than any other color yet found; but it will dissolve other colors in varying degrees, especially if from one-quarter to one-half its bulk of oil of cloves or cinnamon be mixed therewith. Thus, to produce a green ink, two parts of oleic acid and one part of oil of cloves are mixed together and heated, and the green crystals can then be dissolved in the hot oils to the desired density; or the green crystals can first be dissolved in the oil of cloves, cold or hot, and the oleic acid afterward added gradually, and the whole intimately stirred together, which will form a liquid oily green ink of great intensity. Soluble prussian blue may be first moistened with a little sulphuric acid, and can then be mixed with and dissolved in the oleic acid, preferably cold, forming a permanent blue ink. Ultramarine blue will also form a very smooth or intimate mixture with the oleic acid, almost, if not actually, dissolving therein and forming a bright blue permanent ink. Several other pigments or coloring matters may be used in a similar way.

Another blue ink can be made by mixing the described aniline violet and green inks together, the shade of blue depending upon the relative proportions of the two inks. (Patented.)—*Paper and Press.*

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the society was held Wednesday evening, Jan. 14th, 1891, the president, Mr. John G. Bullock, in the chair.

The Board of Directors reported that they had met for organization on December 15th, 1890, and their prospective duties had been divided among the following standing committeees: House Committee—Joseph H. Burroughs, George M. Taylor, John G. Bullock. Committee on Meetings—Charles L. Mitchell, M.D., Robert S. Redfield, Edmund Stirling. Committee on Library and Publications—John C. Browne, George Vaux, Jr., Herbert M. Howe, M.D. Committee on Lantern Slides—William H. Rau, Edmund Stirling, John Carbutt. Committee on Membership—Samuel Sartain, Joseph H. Burroughs, Samuel M. Fox.

The first Thursday afternoon of each month, at 4 o'clock, had been fixed as the time for holding the regular monthly meetings of the Board. By authority of the Board the Committee on Meetings had engaged the lecture-room of the Franklin Institute for one evening each month for the balance of the season, for the purpose of holding exhibitions of lantern slides before members and their friends. The first of these exhibitions was given on Thursday evening, January 8th, by Dr. Charles L. Mitchell, illustrating "Southern Germany and the Tyrol." About 150 slides were shown to a large and appreciative audience. At the Board meeting, January 3d, Mr. J. Somers Smith, Jr., was elected an active member. It was also announced that a public exhibition of lantern slides, representing the work of members, would be given on the evening of Friday, February 20th, at Association Hall.

By recommendation of the Board of Directors, and on motion of Mr. Cheyney, Mr. John Sartain was transferred from active to honorary membership.

On motion of Dr. Mitchell, Mr. Wm. H. Rau was nominated and subsequently elected to represent the society as a director of the American Lantern Slide Interchange for the season of 1891 and '92.

The paper for the evening was read by Mr. Frederic E. Ives, being an abstract of his recent lecture delivered before the Franklin Institute on "Heliochromy or Photography in the Colors of Nature" (see *Journal of the Franklin Institute*, January, 1891). Four permanent color-print heliochromes by his patented process were shown. He also repeated a suggestion which he made, incidentally, in his lecture at the Franklin Institute, and which was not published because the lecture

was in print when the suggestion was made. After speaking of the insensitiveness of the old chloride of silver process, which is suitable only for printing-out undercolored glasses and similar copy, he said he believed a far better printing-out process could be devised, employing fugitive dyes, which, as is well known, are bleached by the light rays which they absorb. He said : "Suppose we take for this purpose three very fugitive dyes, a green-blue, a magenta, and a yellow. Every part of the spectrum can be represented by means of films more or less deeply stained with these dyes, separate or superimposed upon a white surface ; and if the three fully colored films are superimposed together, we get a good black. Project the solar spectrum upon this compound film, and what will it do? Sooner or later, depending upon the light sensitiveness of the dyes, the red rays will bleach the green-blue dye, which is the only one that absorbs those rays, and leave the yellow and magenta unaltered, making a full red. The yellow rays, which are absorbed by the magenta and the green-blue dyes, will bleach them both, leaving only the yellow. The green rays, which are absorbed only by the magenta dye, will bleach it and leave the yellow and green-blue dyes unaltered, making a full green. The blue rays, which are absorbed only by the yellow dye, will bleach it, leaving the green-blue and magenta dyes unaltered, making a full blue. Other parts of the spectrum, acting upon the same principle, will give intermediate tints, by only partly bleaching the dyes which they do not completely absorb, and white light will bleach all the dyes, exposing the white support. It might be possible to mix the dyes so as to apply them together in a single film, as of collodion or gelatine. Should the light-sensitiveness of the dyes be unequal, evenness of action could be secured by the use of light-filters, as in orthochromatic photography. The process might be named "heliochromography." Turmeric exactly fulfills the requirements for a fugitive yellow dye, printing-out completely in a few minutes in bright sunlight. It will be only necessary to find equally fugitive dyes of the right shades of green-blue and magenta-red in order to obtain direct color prints far brighter and truer than the best that have been made on the silver-chloride plates. Cyanine, which prints out as quick as turmeric, makes pictures that can be rendered permanent, but it is not exactly the right shade of blue to carry out the process with only three dyes. There are many coal-tar dyes so fugitive that they have no commercial value, and are not manufactured ; among these it is quite likely that suitable dyes for carrying out the process may be found. Should it ever be found possible to continue, by chemical agency, the process started in the dyes by the light-rays themselves, the picture could then be made

in the camera, and if all the colors could be fixed, like cyanine, when sufficiently reduced, permanent photography in the natural colors would then be within the reach of every amateur. Meanwhile, we shall probably have to content ourselves with the more roundabout but no less scientific and capable method of composite heliochromy."

On motion of Mr. Rosengarten, the society expressed its hearty appreciation of the great work Mr. Ives had accomplished, and tendered him a vote of thanks for his very interesting and valuable communication.

Mr. Browne said he would like to ask Mr. Ives one question. Some time about 1862 or '63 he remembered seeing a daguerreotype plate sent from France, and which M. Becquerel claimed to have been made in the camera. It represented a Scotch plaid or shawl. The picture originally had very bright colors, but was then considerably faded. It was sent here as a very great curiosity, and was shown to some of the members of the Franklin Institute. Did Mr. Ives remember what process that was?

Mr. Ives said it was the same old chloride of silver process, of which they had an illustration now on the president's table. It was considerably brighter than the pictures he had shown them, but it was substantially the same process, and was obtained by two days' exposure in the sunlight, using a portrait lens. A two days' exposure in the sunlight was, of course, entirely impracticable, no matter what the result might be. A method of fixing these pictures permanently had not yet been found; they had to be kept from light.

Mr. Earle showed and described a rubber-type outfit for printing titles, numbers, etc., on negatives. The novel feature was the fact that the type were positive instead of negative, as usual with type. As a consequence, they printed on the film of the negative in *negative letters*, and when so used a print from the negative showed the letters as *positive*, so that they could be read properly on the positive print. The type were easily set up, and could be read and corrected in the holder before any printing was done. It was small enough to be adapted to small prints or lantern slides, and did not detract from the appearance of a picture when thrown on the screen, and that was one of its most important uses.

Mr. Sterling, for the Committee on Meetings, reported the result of the votes cast to select the four "honor pictures" for 1890 from the collection of pictures contributed by members, which had been on exhibition since the December meeting. The pictures chosen were: No. 147, "A Swiss Valley," by Dr. Charles L. Mitchell; No. 133, "Mending Their Ways," by Robert S. Redfield; No. 185, "West-

ward as Far as the Eye Can Reach," by John G. Bullock; No. 131, "Flo," by Clarence B. Moore.

The meeting closed with an exhibition of lantern slides by Mr. A. M. Spangler, a visitor, representing a large number of views in the Yellowstone Park, etc. Many of the slides were colored to show the vivid hues of the rocks and geyser formations in that wonderful region, which added greatly to the interest of the collection. Adjourned.

ROBERT S. REDFIELD, *Secretary.*

DIAZOTYPES.

MR. JOHN CARBUTT delivered a lecture before the Franklin Institute, January 5th, on "Some New Applications of Photography." He first described the diazotype process of photographic dyeing and printing, which was discovered by Arthur G. Green, of London, and recently made public. The process is distinctively a positive one, as a positive is obtained from a positive, instead of a positive from a negative, as in ordinary photographic printing. The operations are very similar to those required in silver printing.

The base of the diazotype print is primuline, which is extensively used in dyeing calico. The material to be printed upon, Mr. Carbutt explained, is dyed in a solution of primuline in water, making it of a primrose hue, and washed and dried. The sensitizing is performed by immersing the dyed material in a solution of sodium nitrate and oxalic acid in water. The printing is done in sunlight or by artificial light, using a transparent positive instead of a negative.

The developing of the partially visible image is almost instantaneously accomplished by pouring over the print the "developer" as a photographer would call it, or what a dyer would style the "mordant." Different colors, such as red, yellow, orange, purple, brown, or black, are produced by employing developers of various ingredients, as described by Mr. Carbutt. The lecturer developed a print on muslin, and several on glass, coated with gelatine, demonstrating very clearly the points made in his description of the process.

Mr. Carbutt then exhibited on the screen a series of interesting views made by himself with a hand camera during a trip abroad last summer. He also showed a very ingenious and compact new hand camera named the "Genii," which holds twelve glass plates or twenty-four cut films, and has an efficient device for bringing the plates into position for exposure.—*Public Ledger.*

EDITORIAL.

IN the September JOURNAL we published a formula for a combined eiko and hydroquinone developer for orthochromatic plates and where it was desired to obtain true color values. The more we use this formula the more we like it. In addition, one of the leading dry-plate makers lately informed us that after a thorough trial he had found it superior to all others in bringing out the detail and color values. For the benefit of our many new subscribers we will republish the formula for color values, viz.:

Sulphite of soda	5 drachms.
Eikonogen	45 grains.
Hydrochinone	15 grains.
Water, distilled	8 oz.

Heat water to boiling point, and add sulphite of soda ; when this is dissolved add eikonogen, then the hydrochinone. After this solution is cold add carbonate of potash $1\frac{1}{2}$ drachms. For time exposures take equal parts of developer and distilled water. For instantaneous and dropshutter exposures substitute hydrochinone 20 grains in place of 15 grains, and use the developer without diluting with water. In either case the image should come up quickly and perfect in all details, with full density in the shadows.

We have lately had occasion to copy several historic oil paintings of old revolutionary subjects. Of the originals one was by Trumbull, painted on a panel ; another a miniature by Peale, on ivory ; while the rest were on canvas. The same characteristics, however, prevailed in all ; yellow upon blue predominated, with a grey background, and flesh-tints yellowed and discolored by age. More unpromising subjects can hardly be imagined. A previous attempt by a leading professional had resulted in failure. With considerable misgivings we started on the task. The commercial orthochromatic plate was used, without color screen ; the development was with our combined developer, the formulæ of which is republished above. The result was all that could be wished for, with yellows lighter than blue, and all graduations of color values plainly marked. In conclusion, we repeat that to attain true color values we have to look to our developers, as well as to the composition of the emulsion upon our films.—J. F. SACHSE.

WE regret to hear of the sad domestic affliction which has befallen Mr. J. Traill Taylor, the able editor of the *British Journal of Photography*, in the loss of his wife, who died on the 23d of December last of pneumonia, after an illness of only two days. We unite with his friends beyond the sea in deep sympathy with him in his sad bereavement.

WITH deep regret we chronicle the death of Mr. William Adcock, of Melton Mowbray, England. It is but a few weeks ago that we received a box of negatives from Mr. Adcock, with a cheering letter of encouragement for our efforts on the JOURNAL; unfortunately the plates arrived in a broken condition, and we are unable to show our readers a specimen of Mr. Adcock's proficiency as a photographer. Besides being an enthusiast in our art, he took an active part in the volunteer movement, holding rank as captain in the local volunteer corps. He died December 21st, 1890, at the age of sixty-nine years.

OUR ILLUSTRATIONS.

OUR frontispiece is from a series of negatives taken by Mr. Wm. B. Wood, of Philadelphia. These choice photographic "bits" are all within the bounds of Fairmount Park, on the Wissahickon, that romantic stream which forces its way through the wild rugged dell, purling over rock and ledge, until its waters mingle with the placid Schuylkill. The set furnished for the AMERICAN JOURNAL OF PHOTOGRAPHY are all of equal excellence. The lens used, Steinheil, Series 2, No. 4, stop 50; exposure, from six to ten seconds on rapid plates.

Our process illustration, "Cleopatra," from photograph from original painting in the Paris Salon, is reproduced by the Ives process, and speaks for itself.

The story goes that a photographer at Southampton had a dozen *cartes* for a gentleman living at Plymouth. When about to send them off he discovered that he had forgotten the name of his client. What was he to do? After he had long but uselessly racked his brain, he at length uttered a sigh of relief. He gummed one of the likenesses on the envelope and wrote underneath: "To the above gentleman in Plymouth." *The cartes were duly delivered.*

In the Twilight Hour.

THREE ROSES.

TOGETHER on a slender spray they hung,
Dowered with equal beauty, passing fair,
And blent, as though an unseen censer
swung,
Their mingled perfume with the morning
air.

Not theirs the fate to linger till decay
Strewed their sweet-scented petals on the
ground,
For ere the close of that bright summer
day
Each sister rose another fate had found.
Twined in the meshes of a beauty's hair
One blossom faded slowly, hour by hour,
Until, at parting, some one in despair
As a memento craved the withered
flower.

One went an offering to a vain coquette,
Who plucked its leaves, and as they
fluttering fell,
Whispered a test that has believers yet,
"He loves me—loves me not—he loves
me well."

A maiden's form lies in a darkened room,
In folded hands, upon a pulseless heart,
One touch of color in the deepening gloom,
The last of the three roses is at rest.

ENVOY.

O Love and cruel Death, so far apart,
Rose-sisters fair, could I but change with
thee,
And choose the fate of either of the three,
O happiest rose of all, my choice would be
Thy place above the maiden's pulseless
heart!

—J. H. Symes, in *Chambers' Journal*.

BE cheerful always.

A CLIMAX in life is only a fresh starting
point.—F. G. Peabody.

WEIGH each day's self-interest in the
scales of eternity.—Wm. Durant.

OUR children will be better, do more,
love more, and be in every way in advance
of ourselves.—Wm. M. Baker.

THE Christian man whose character has
become stereotyped or crystallized has be-
gun to decay.—E. G. Robinson.

PURE goodness, even on the scale of
human estimate, is more likely to pay than
any mere self-seeking.—Russel.

To rejoice in another's prosperity is to
give content to your own lot; to mitigate
another's grief is to alleviate or dispel your
own.—Tryon Edwards.

KIND looks, kind words, kind acts, and
warm handshakes,—these are the sec-
ondary means of grace when men are in
trouble and fighting their unseen battles.—
John Hall.

THERE is a great work for to-day. What
we do will stay done, and will tell grandly
on the ages to come. What we leave un-
done will breed confusion and disaster, and
our children's children will justly hold us
responsible for not laying hold of the oppor-
tunities afforded us.—F. A. Noble.

WOMAN is not inferior to man, but holds
a somewhat different sphere. She should
not seek to be his tyrant, or consent to be
his slave. Her throne is his heart; her
empire the family, with its far-reaching re-
lationships. As daughter, wife, sister,
mother, she needs an education as high and
broad and varied as man's.—Dr. Burchard.

MANY a child goes astray simply be-
cause home lacks sunshine. A child needs
smiles as much as the flowers need sun-
beams. If a thing pleases, they are apt to
seek it; if it displeases, they are apt to
avoid it. If home is a place where faces are
sour and words harsh and faultfinding is
ever in the ascendant, they will spend as
many hours as possible elsewhere.

Queries and Answers.

AN esteemed photographic contemporary, in its salutatory for 1891, states: "We have never printed a question that has not come from a *bona fide* inquirer, although there are journals where such queries are concocted in the office of the editor." We are not certain whether this is an innuendo intended for us or not, nor do we want to analyze the first part of the statement for the percentage of *ananas* contained therein. Superficially we swallow it as a decidedly saturated solution. But, as to the second part, if the soft impeachment is intended to be personal, we wish to say just here, so far as the AMERICAN JOURNAL OF PHOTOGRAPHY is concerned, that that part of the statement is the case, and what is more, we think the new department is fully up to the standard.

N. B.—Full attention will be paid to anonymous communications; ditto to such as are written on both sides of the paper.

Wet Plate.—Blitz pulver is not powdered lightning, but a magnesium compound for taking photographs.

Old Subscriber.—You cannot come that dodge on us. If you are an *old subscriber* consult your November and December numbers.

Constant Reader.—No reduction in price can be made. The JOURNAL gives the best value for the price of any photographic paper published in America.

Mrs. S. de Jones O'Bragas, Newport, R. I.—The mercury solutions used for bleaching negatives before intensifying should not be used for bleaching handkerchiefs and other *lingere*.

Amateur.—Of course it is the fault of your lens if your plates fog during development. It could not be any fault of yours in the manipulations or exposure. These are only secondary matters in amateur photography.

Isidore.—We have tested the two plates in the holder you sent us, and we find that you either forgot to draw the slide, or else to uncaps the lens. In fact, they were not exposed at all. But do not let a little oversight like this disturb you. Practice makes perfect. Your lense has nothing to do with your failure in this case.

Count Max von Habenichts.—In reply to your inquiry, whether photographs of your American wife would find a ready sale on the American market, we will state: decidedly not. The great majority of American citizens have no interest whatever in any deluded girl who purchases an effete, bankrupt nobleman for a husband.

Photographic Student.—The best way to become proficient in photography is to keep posted by studying the photographic literature of the day. If you wish to cover the whole photographic field, professional and amateur, subscribe to the AMERICAN JOURNAL OF PHOTOGRAPHY and the *American Amateur Photographer*. Refer to our clubbing list.

Chautauqua.—Your manuscript received in good order; the blue ribbon around it was not even rumpled. We return it by mail, with thanks. In regard to your inquiry, whether in our opinion you should engage in writing as a profession, our answer is: Don't, better part your hair in the middle, and get a situation back of the calico counter in a dry-goods store.

Prof. Jerome Quinal, Hackensack.—We would not advise you to cut several small holes in the bellows of your camera so as to equalize the air with the outside temperature. Your theory upon the subject may be all right from your standpoint; but in our every-day practice we would prefer to have our bellows intact. We cannot say whether your idea is patentable or not.

J. FOCUS SNAPPSCHOTTE.

Literary and Business Notes.

OUR contemporary, the *Photographic Globe* for January, treats its readers to an exquisite artotype, "Childhood," by E. Bierstadt, of New York; for chasteness and beauty of execution we rarely see its equal. The pose and lighting are especially fine. The photographer was Mr. Almstaedt, of Staten Island.

THE January number of the *Beacon*, the first of Volume III., has come to hand. We congratulate the publishers and the editors on the improved appearance of the publication, and wish them their well-merited success. The addition of an illustration is a further improvement that will prove acceptable to the subscribers.

NO. 1, Vol. II., of *Entomological News*, for January, 1891, has been received. The *News* comes to us in an enlarged form, with the promise that as soon as the subscription list shall justify it, a further increase in pages will be made. The *News* is ably edited by Dr. Henry Skinner, curator of the entomological section of the Academy of Natural Sciences, Philadelphia. The frontispiece for the current number is the *Cithronia regalis* (larva), which we introduced to our readers a few months ago. A feature of the *News* is an exchange list of all butterflies of America, north of Mexico, compiled by Dr. Skinner. It is so arranged that duplicates and desiderata can be marked, which will prove of great convenience for all who have use for the list.

PHOTOGRAPHISCHER ALMANACH UND KALENDER FÜR 1891. Düsseldorf, Ed. Liesegang.

A photographic annual, different in one respect from all others, viz., less shell and more meat. The almanack is full of interesting photographic matter, of value to the professional as well as the amateur. Dr. Liesegang is well known to our readers from the frequent quotations from the *Archiv*. It is hard to single out any special article from the almanack, as they all seem to be of almost equal excellence.

Three photo-ink illustrations embellish the annual, the most important of which is the callotype frontispiece, a portrait of Franz Veress, of Kolszovar, in Transylvania; a short biographical notice and description accompanies the portrait. A compact summary of photographic formulæ completes the work, which we commend to all photographers conversant with the German language.

The *Post-Express*, of Rochester, N. Y., January 15th, 1891, publishes the following in relation to the new plant of the Eastman Company:

"As an illustration of what can be done by a combination of energy and money, the boulevard plant of the Eastman Company furnishes about as good an example as this vicinity affords. It was only a few weeks ago that the company bought fifteen acres of land at Handford's landing, and made known its intention to construct extensive buildings there to meet the worldwide demand for its photographic goods. As one goes down the boulevard to-day he sees to the left on approaching Hanford's landing three large buildings in a group, a few hundred feet back from the boulevard, situated in a site that was under cultivation a year ago.

"It is the intention of the company to have the new plant ready to begin work there by April 1st, but it does not expect to have all its buildings complete inside of two years, for in addition to the three now standing, it proposes to construct six others, including a camera department, which is to be erected on the wing facing the Handford's landing road. The location was selected with a view to avoid dust, and for that purpose, as well as to please the eye, the company intends to lay out its grounds artistically and cultivate a sod. Of the importance of the enterprise to the city, it is enough to say that the company now employs 450 men. With the increased facilities which it will possess when the new plant is occupied the number, of course, will be much greater."

RECENT PATENTS.

THE following list of patents issued during the month of January to citizens of the United States is specially reported by Franklin H. Hough, Solicitor of American and Foreign Patents, 925 F. Street, N. W., Washington, D. C.

ISSUE OF JANUARY 6TH, 1891.

444,361—Photographic Camera Shutter; G. F. Kincaid, San Francisco, Cal.
444,083—Photographic Shutter; E. Bausch, G. Hommel, and A. Wollensak, assignors to Bausch and Lomb Optical Co., Rochester, N. Y.
444,084—Photographs and Other Prints, Enameling; C. C. F. Brandt, Muscatine, Iowa.

ISSUE OF JANUARY 13TH, 1891.

444,448—Automatic Camera; E. G. Fisher and R. McFarlane, assignors to Fisher Speciality Co., Minneapolis, Minn.
444,535—Photographic Apparatus; L. Lumiere, Lyons, France.
444,422—Photographic Apparatus for Holding and Developing Dry Plates; G. H. Cobb, Elmira.
444,806—Photographic Camera; E. B. Baker, assignor to E. & H. T. Anthony, New York City.
444,714—Photographic Objective; P. Rudolph, assignor to C. Ziss, Jena, Germany.

ISSUE OF JANUARY 20TH, 1891.

None.

ISSUE OF JANUARY 27TH, 1891.

445,232—Photographic Apparatus, C. Pasquarelli, assignor to C. A. Steinheil, Sohne, Munich, Germany.
445,188—Photography, Artificial Light for; T. H. McCollin, Lansdowne, Pa.

